

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the present application.

**LISTING OF CLAIMS**

1. (Currently Amended) A microfluidic device comprising:  
a unitary body comprising a first fluid passage; a second fluid passage; a membrane positioned separating the first fluid passage from the second fluid passage and in communication with the first fluid passage and the second fluid passage;  
a first electrode positioned in the first fluid passage; and  
a second electrode positioned in the second fluid passage;  
wherein a potential applied to the first and second electrodes passes electrons from the first fluid passage to the second fluid passage through the membrane,  
~~further wherein the first fluid passage intersects the second fluid passage where the membrane is positioned separating the first fluid passage and the second fluid passage,~~  
wherein the first fluid passage includes one or more first reservoirs and the first electrode is positioned in one of the first reservoirs, and  
wherein the first fluid passage, the membrane and the second fluid passage form a 3-level structure with the first passage and the second passage separated by the membrane.
2. (Original) The device of claim 1, wherein the body is polymethylsiloxane material (PDMS).
3. (Original) The device of claim 1, wherein the membrane is a gel made of agarose.

4. (Original) The device of claim 1, wherein the membrane is a semipermeable membrane made of regenerated cellulose.

Claim 5. (Canceled).

6. (Previously Presented) The device of claim 1, wherein the second fluid passage includes one or more second reservoirs and the second electrode is positioned in one of the second reservoirs.

Claims 7 to 24. (Canceled).

25. (New) The device of claim 1, further comprising an elongated membrane passage disposed within the unitary body, the elongated membrane passage positioned between and contacting the first fluid passage and the second fluid passage.

26. (New) The device of claim 25, wherein the first fluid passage, the second fluid passage and the membrane passage are elongated cylindrical passages, wherein an outer diameter of the first fluid passage and an outer diameter of the second fluid passage contact the membrane passage.

27. (New) The device of claim 25, wherein the membrane is a gel plug.

28. (New) The device of claim 25, wherein the unitary body includes an upper surface a lower surface and side surfaces, the elongated membrane passage extending across the unitary body from a first side surface to a second side surface.

29. (New) The device of claim 1, wherein the unitary body including an upper surface a lower surface and side surfaces, the membrane extending across the unitary body from a first side surface to a second side surface.